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FOLDING GPU ATTACHMENT

HP INC

Folding GPU Attachment

This disclosure relates to the PC industry and focuses on mobility. With the need to always be connected, new form factors have been invented to supplement the increasingly mobile workforce. Devices like x360 notebooks, detachable tablets, iPads, and smartphones are becoming more and more popular. Typically, mobility devices are small and lightweight, but sometimes lacking in performance. This is good for emails or light web surfing on the go, but when the user needs graphic intensive performance this device may suffer. The GPU attachment disclosed is specifically designed for a notebook and can be folded for improved mobility and ergonomics.

For gaming, 3D design, photoshop, and other graphic intensive programs a discrete graphics card is needed. A graphics dock with thermal solution can be utilized to help keep the heavy weight components off the main device. This dock can mechanically attach to the unit with an added feature of folding under the unit (See Fig. 1). This will benefit the user in 2 ways. When folded, the device and dock can easily be transported. It can be carried and will not have a heavy dock hanging from the device placing a lot of strain on the connection. Folding the dock under the unit will also give the device a tilt (See Fig. 2). It is known that some users prefer a tilt to their keyboard. Desktop keyboards as well as surface pro-like keyboards can be lifted to give the user a better ergonomic experience.

The GPU attachment consists of a discrete graphics card with a high-speed connection to the host (See Fig. 3). This attachment also has a thermal solution consisting of a heat sink and fans. Special care needs to be taken when orienting the fans. The attachment should have a hinge near the connector to allow for folding under the unit. When the attachment is folded under the unit, the direction of the fan hot air outlet will be changed. At this point the fans are closer to the user therefore the fans should be slightly tilted away from the user. When the attachment is unfolded, when the user wants the notebook flat, the fans will be directed slightly towards the user (See Fig. 4). Since the GPU is behind the unit in this arrangement, the hot air will not affect the user. This attachment could include an optional battery for the user that does not want to carry an AC adapter around. This will make the dock even heavier, which is more of a reason to have it fold under the unit for secure transportation. The battery needs to have a large capacity to support the power requirements of the GPU and fans.

Notebooks would be specifically designed for this accessory. The ports need to be on or near the back surface. Mechanical features should also be included on the back of the notebook to help the dock attach to the notebook securely. On the inside of the bottom surface of the laptop would be magnets that attract to corresponding magnets on the surface of the attachment. These magnet pairs help securely attach the dock under the unit (See Fig. 1).

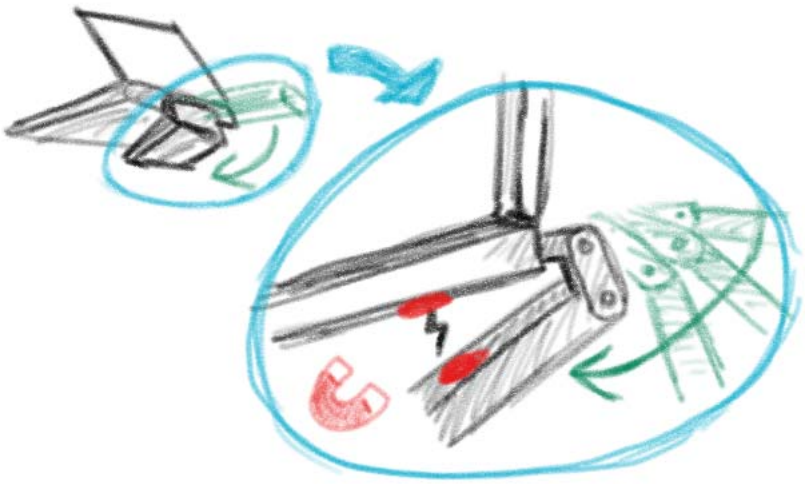

Fig. 1. This figure illustrates how the attachment is folded under the unit and the magnets are attracted.

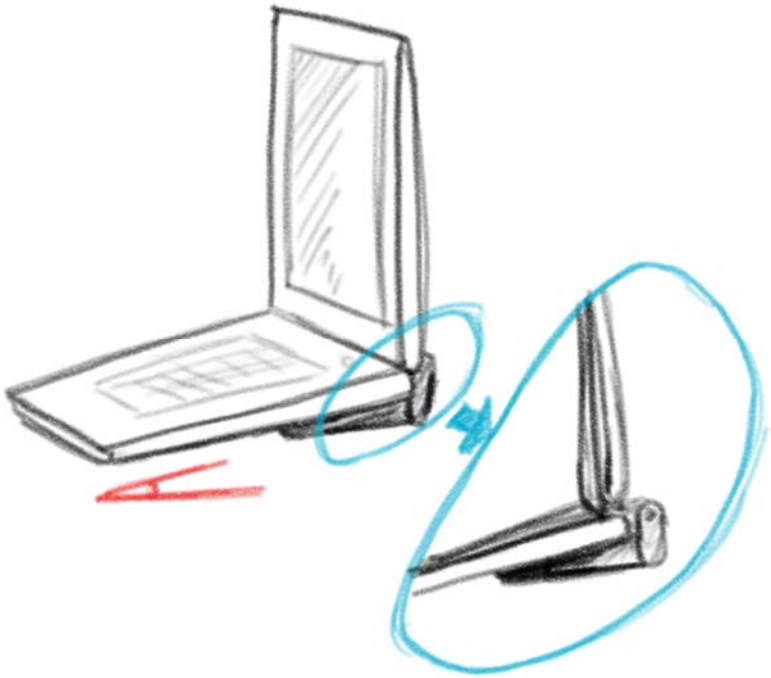

Fig. 2. This figure depicts the dock oriented under the unit and the device will have a slight tilt for a better ergonomic keyboard.

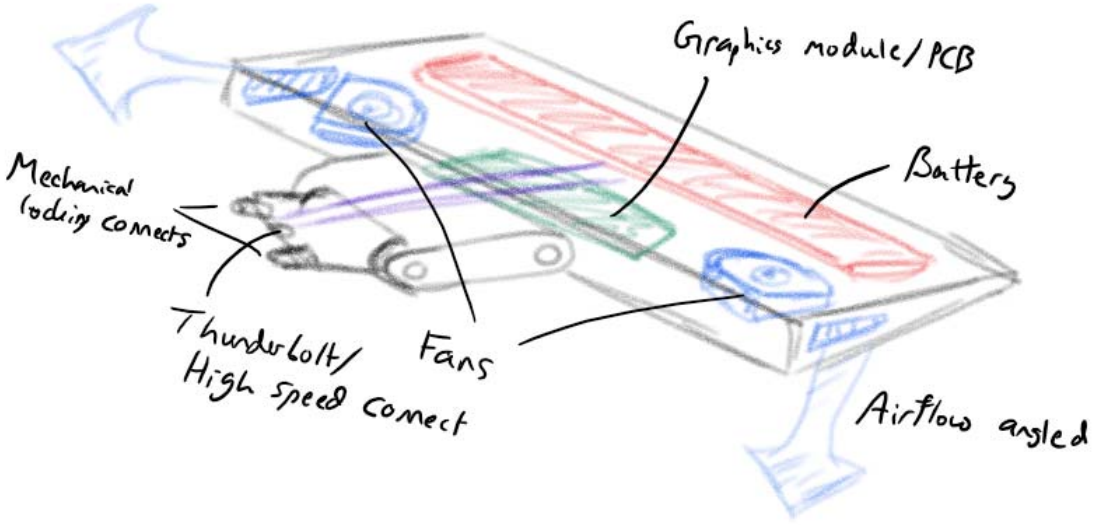

Fig. 3. The figure above illustrates a rough layout of the idea. Only the GPU attachment is shown.

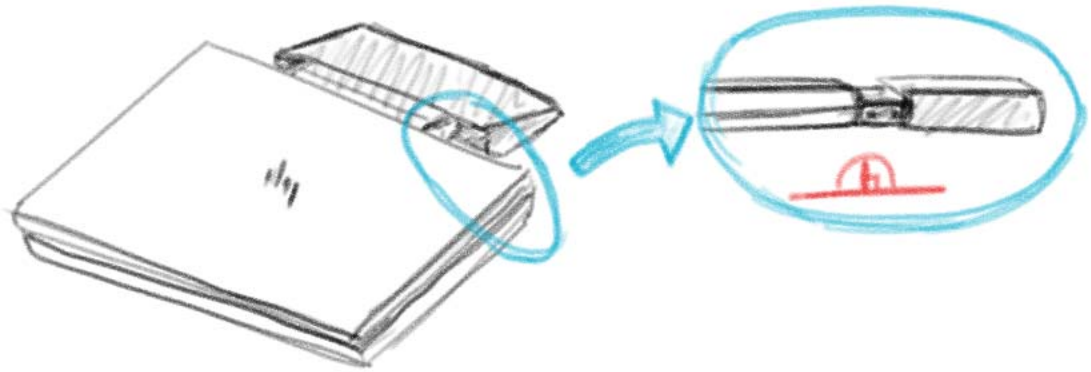

Fig. 4. This figure illustrates using the attachment folded out and the notebook is flush to the table.

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